Updates on treatment guidelines for psoriasis, atopic dermatitis (eczema), hidradenitis suppurativa, and acne/rosacea during the COVID-19 pandemic

Rebecca M Yim BA, Indira Singh MD, April W Armstrong MD MPH

Affiliations: Department of Dermatology, University of Southern California, Los Angeles, California, USA

Corresponding Author: April W Armstrong MD, University of Southern California, 1975 Zonal Avenue, KAM 510 MC 9034, Los Angeles, CA 90089, Tel: 323-442-2605, Email: armstrongpublication@gmail.com

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Abstract

Owing to the evolving COVID-19 pandemic and emerging data regarding immunosuppressant therapies for inflammatory cutaneous diseases, dermatologists are being encouraged to reevaluate their patients' treatment regimens to minimize any potential risk of SARS-CoV-2 infection. This article includes an overview of the up-to-date international and U.S. treatment guidelines for psoriasis, atopic dermatitis, hidradenitis suppurativa, and acne/rosacea; it provides tables summarizing these resources to assist providers and patients in remaining updated regarding recommended treatment modifications during the pandemic (See Tables 1-4).

Keywords: COVID-19, SARS-CoV-2, psoriasis, atopic dermatitis, hidradenitis suppurativa, acne, rosacea

Introduction

The pandemic of COVID-19 began in December 2019 and the SARS-CoV-2 virus has spread via person-to-person transmission through respiratory and contact transmission. The virus predominantly presents as a severe pneumonia with fever, dry cough, fatigue, and occasionally gastrointestinal symptoms [1]. According to the CDC and WHO, as of October 7, 2020, 208,787 total deaths in the United States and 1,044,269 total deaths worldwide are attributed to COVID-19 [2,3]. The majority of deaths have occurred in the elderly, individuals with chronic diseases, and immunocompromised persons [4].

The impact of inflammatory skin diseases and their associated therapies on the clinical course of COVID-19 is an area of active exploration. For example, as clinicians, the following questions frequently emerge during practice: Do patients with chronic inflammatory skin diseases and/or those taking the associated therapies have increased risk of contracting COVID-19? Do patients with chronic inflammatory skin diseases and/or those taking the associated therapies have a more severe clinical course of COVID-19 infection?

Because data are accumulating, guidelines and recommendations regarding the management of common inflammatory skin diseases are critical as they inform clinicians how to care for these patients during this time of evolving evidence. The treatment guidelines vary in their discussion of the patient's infection status and their concurrent regimen. This article aims to summarize the current international and U.S. guidelines from key organizations regarding the treatment of common inflammatory skin diseases—psoriasis, atopic dermatitis, hidradenitis suppurativa, and acne/rosacea—during the COVID-19 pandemic. We also identify the differences in guidelines and provide tables containing links to these governing organizations, which dermatologists and patients can readily reference for updated recommendations.

Psoriasis

The professional societies that have issued guidelines or recommendations on psoriasis management during COVID-19 include the International Psoriasis Council (IPC), the European

Table 1. *Recommendations on psoriasis management by international and U.S. organizations during the COVID-19 pandemic.*

Status of Infection:	International Recommendation: International Psoriasis Council (IPC) and the European Association of Dermatology and Venereology (EADV) Psoriasis Task Force/SPIN	U.S. Recommendation: National Psoriasis Foundation (NPF)	U.S. Recommendation: American Academy of Dermatology (AAD) (For all dermatological diseases on systemic immunosuppressive medication during COVID-19)****
No active COVID-19 infection, on systemic therapy (ie. biologics or oral medications)	Continue taking systemic therapy (EADV)	Continue taking systemic therapy	Consult a physician who can weigh the risks and benefits of systemic therapy on a case-by-case basis
High-risk group, on immunomodulatory agents	Consult a healthcare provider regarding these risk factors* (EADV)	Consult a healthcare provider regarding these risk factors**	No statement at this time
No active COVID-19 infection, being considered to initiate immunomodulatory agents	No statement at this time	Consult a healthcare provider	For lower-risk patients, consult a physician who can discuss the risks and benefits before beginning treatment. For high-risk*** patients, postpone initiation of treatment.
COVID-19 infection, on systemic therapy (ie. biologics or oral medications)	Discontinue or postpone taking immunosuppressant treatment (IPC, EADV)	Consult a healthcare provider	Discontinue or postpone systemic therapy until recovery from COVID-19
Recovered from COVID-19	No statement at this time	Consult a healthcare provider	Re-initiate systemic therapy upon confirmation of full recovery from COVID-19

Professional Organization:	Resource:
IPC	https://www.psoriasiscouncil.org/blog/Statement-on-COVID-19-and-Psoriasis.htm
EADV Psoriasis Task Force/SPIN	https://www.eadv.org/cms-admin/showfile/7_PSORIASIS-SPIN%20TF%20Recommandations_Covid-Corner.pdf
NPF	https://www.psoriasis.org/advance/coronavirus
AAD	https://www.aad.org/member/practice/coronavirus/clinical-guidance/biologics

*For EADV, high-risk is defined as advanced age (60 or older), have underlying health conditions (ie. obesity, diabetes, hypertension, cardiovascular disease, chronic lung disease, asthma), and those who live in an area of high incidence of COVID-19 or those who have close contacts of confirmed COVID-19 cases.
**For NPF, high-risk is defined as advanced age (65 or older) and having comorbidities such as chronic lung, heart, or kidney disease and metabolic disorders such as diabetes and obesity.
***For AAD, high-risk is defined as advanced age (60 or older), or patients with recognized comorbidities such as cardiovascular disease, diabetes, severe hypertension, liver disease, kidney disease, respiratory system compromise, internal malignancies or tobacco use.
****The AAD recommendations are not specific to psoriasis.

Association of Dermatology and Venereology (EADV) Psoriasis Task Force/SPIN, and the National Psoriasis Foundation (NPF), (**Table 1**). The American Academy of Dermatology (AAD) also issued recommendations regarding systemic immunomodulatory therapies for dermatologic diseases though those recommendations are not specific to psoriasis (Tables 1-3).

In patients with psoriasis and/or psoriatic arthritis on biologics or oral treatments and without active COVID-19, the NPF recommends continuing biologic or oral systemic treatment (**Table 1**), [5]. According

to the NPF, the benefit of continuing psoriasis treatment outweighs the hypothetical risk of increased adverse COVID-19 related outcomes associated with immune-modulating therapy. In addition, stopping therapy may reduce the efficacy of the immunomodulatory agents on re-initiation [6]. The EADV recommendations are similar to that of NPF in this cohort [7].

In high-risk patients on immune-modulating therapy, the NPF recommends consulting a healthcare provider regarding these risk factors (**Table 1**), [5]. The risk factors as defined by the NPF are advanced age (65 or older) and the presence of comorbidities such as chronic lung, heart, or kidney disease and metabolic disorders such as diabetes and obesity [5]. According to the NPF, the likelihood of a poorer COVID-19 outcome is driven by these risk factors and those who have psoriasis are more prone to these comorbidities, especially in those with severe psoriasis [5]. The EADV recommendations are similar to that of NPF in this cohort and they endorse that individual consideration be given when deciding to temporarily discontinue therapies. The European Association of Dermatology and Venereology definition of high-risk patients is more expansive than that of the NPF by additionally including those who live in an area of high incidence of COVID-19 or those who have close contacts of confirmed COVID-19 cases [7].

In patients with severe psoriasis and/or psoriatic arthritis being considered for initiation of an immunomodulatory agent and without COVID-19, the NPF recommends consulting a healthcare provider (**Table 1**), [5]. In patients who do not have significant risk factors, one can consider initiating systemic treatments to decrease the morbidity associated with severe psoriatic diseases. If high risk factors are present, one might consider delaying immune modulating treatment [6]. However, an important factor to consider is that untreated psoriatic disease is associated with severe impact on one's physical and emotional health and can lead to permanent joint damage [5].

In patients with COVID-19 on biologic or oral immune-modulating treatment, the NPF recommends consulting a healthcare provider (**Table 1**), [5]. By comparison, IPC and EADV recommend that patients in this cohort should discontinue or postpone treatment [7,8].

In patients who have recovered from COVID-19, the NPF recommends consulting a health care provider (**Table 1**), [5]. In patients who have fully resolved COVID-19 symptoms, the majority can resume treatment. However, in patients who have had severe COVID-19 disease and required hospitalization, it is recommended to consult a healthcare provider and reach a shared-decision [5].

Atopic dermatitis

The professional societies that have issued guidelines or recommendations on atopic dermatitis management during COVID-19 include the International Eczema Council (IEC), (**Table 2**). Although no explicit guidelines are currently available through the National Eczema Association (NEA) from the U.S., a record of expert panel discussion is available through its website. The AAD also issued recommendations regarding systemic immunomodulatory therapies for skin diseases though those recommendations are not specific to atopic dermatitis (**Tables 1-3**).

In atopic dermatitis patients on systemic treatment and without active COVID-19, the IEC recommends continuing systemic treatment, such as conventional immunosuppressive drugs, biologics, and small molecules (systemics), (**Table 2**), [9]. The same recommendations apply to those with asymptomatic or mildly symptomatic COVID-19.

In patients on systemic treatment for AD with an active COVID-19 and especially in symptomatic patients requiring interventions or hospitalization, the IEC recommends discontinuing or reducing the dose of systemic treatments (**Table 2**), [9]. However, because asthma can be a risk for a severe COVID-19, for patients who have asthma as a comorbidity it is important to continue systemic treatment such as a biologic for asthma.

Although there are no explicit guidelines or recommendations on AD management during COVID-19 issued by the NEA, one AD expert recommends that AD patients on certain systemic immunosuppressants, specifically, oral prednisone,

Table 2. *Recommendations on atopic dermatitis management by international and U.S. organizations during the COVID-19 pandemic.*

Status of Infection:	International Recommendation: International Eczema Council (IEC)	U.S. Recommendation: American Academy of Dermatology (AAD) (For all dermatological diseases on systemic immunosuppressive medication during COVID-19)**
No active COVID-19 infection, on systemic therapy (ie. on biologics or oral medications)	Asymptomatic or mildly symptomatic of COVID-19: Continue systemic immunosuppressant treatment Active or symptomatic of COVID-19: Discontinue or dose-reduce systemic therapy	Consult a physician who can weigh the risks and benefits of systemic therapy on a case-by-case basis
No active COVID-19 infection, being considered to initiate immunomodulatory agents	No statement at this time	For lower-risk patients, consult a physician who can discuss the risks and benefits before beginning treatment For high-risk* patients, postpone initiation of treatment
COVID-19 infection, on systemic therapy (ie. on biologics or oral medications)	Discontinue or dose-reduce systemic therapy	Discontinue or postpone systemic therapy until recovery from COVID-19
Recovered from COVID-19	No statement at this time	Re-initiate systemic therapy upon confirmation of full recovery from COVID-19

Professional Organization:	Resource:
IEC	https://www.eczemacouncil.org/news/iec-statement-on-covid-19/
AAD	https://www.aad.org/member/practice/coronavirus/clinical-guidance/biologics
National Eczema Association (NEA)***	https://nationaleczema.org/ate-covid-19/

*For AAD, high-risk is defined as advanced age (60 or older), or patients with recognized comorbidities such as cardiovascular disease, diabetes, severe hypertension, liver disease, kidney disease, respiratory system compromise, internal malignancies or tobacco use.
**The AAD recommendations are not specific to atopic dermatitis.
***The NEA has a podcast, but does not classify this as recommendations.

cyclosporine, methotrexate, azathioprine, or mycophenolate mofetil, should take precautions to limit physical contact with others [10].

Hidradenitis suppurativa

The professional societies that have issued guidelines or recommendations on hidradenitis suppurativa (HS) management during COVID-19 include the European Hidradenitis Suppurativa Foundation (EHSF) and the EADV Acne, Rosacea, HS Task Force (**Table 3**). Although no explicit guidelines are currently available through the Hidradenitis Suppurativa Foundation (HSF) from North America, a record of frequently asked questions and answers regarding HS and COVID-19 is available through its website (**Table 3**). The AAD has recommendations on systemic immunomodulatory therapies, but they are not specific for HS (Tables 1-3).

In HS patients on biologics without symptoms of COVID-19, experts from the HSF recommend that these HS patients continue their current biologic regimen, such as TNF inhibitors (adalimumab, infliximab), IL12/IL23 inhibitors (ustekinumab), and IL17 inhibitors (secukinumab), (**Table 3**), [10]. By comparison, the EHSF and the EADV Acne, Rosacea, HS Task Force recommend taking precautions with TNF inhibitors (**Table 3**), [11]. According to the EADV, there is a potential slightly increased risk for an upper respiratory tract infection with the use of TNF inhibitors, especially for infliximab.

In patients on systemic treatment for HS who have developed symptoms suspicious for COVID-19, the EHSF and the EADV Acne, Rosacea, HS Task Force recommend consulting with the physician and/or postponing or discontinuing the systemic therapy (**Table 3**), [11]. In comparison, for those developing symptoms of COVID-19 or who have known SARS-CoV-2 exposure, the expert opinions from the HSF concur with consulting a healthcare provider, who may recommend delaying a dose of the immunomodulator [10].

In patients on systemic treatment for HS and who have active COVID-19, the EHSF and the EADV Acne, Rosacea, HS Task Force recommend discontinuing the immunomodulatory agent and consulting a doctor (**Table 3**), [11]. In this cohort, the expert

Table 3. *Recommendations on hidradenitis suppurativa management by international, North American, and U.S. organizations during the COVID-19 pandemic.*

Status of Infection:	International Recommendation: European Association of Dermatology and Venereology (EADV) Acne, Rosacea, HS Task Force, and the European Hidradenitis Suppurativa Foundation (EHSF)	North American Recommendation: Hidradenitis Suppurativa Foundation (HSF)	U.S. Recommendation: American Academy of Dermatology (AAD) (For all dermatological diseases on systemic immunosuppressive medication during COVID-19)***
Without symptoms of COVID-19, on biologic therapy	Take extra precaution with TNF-alpha inhibitors	Continue current biologic regimen	Consult a physician who can weigh the risks and benefits of systemic therapy on a case-by-case basis
No active COVID-19 infection, being considered to initiate immunomodulatory agents	No statement at this time	No statement at this time	For lower-risk patients, consult a physician who can discuss the risks and benefits before beginning treatment For high-risk* patients, postpone initiation of treatment
With symptoms suspicious of or have active COVID-19 infection, on systemic therapies (ie. biologics or oral medications)	Symptoms suspicious of COVID-19: Consult a healthcare provider and/or postpone or discontinue systemic therapy Confirmed active COVID-19: Discontinue taking immunomodulatory agent and consult a doctor	Symptoms suspicious of COVID-19**: Consult a healthcare provider, may recommend delaying a dose of the immunomodulator Confirmed active COVID-19: Consult a healthcare provider, may recommend stopping immunomodulatory agents	Symptoms suspicious of or confirmed active COVID-19: Discontinue or postpone systemic therapy until recovery from COVID-19
Recovered from COVID-19	No statement at this time	No statement at this time	Re-initiate systemic therapy upon confirmation of full recovery from COVID-19

Professional Organization:	Resource:
EADV Acne, Rosacea, HS Task Force, and the EHSF	https://eadv.org/cms-admin/showfile/_HS%20TF%20Recommandations_COVID%20Corner.pdf
HSF	https://www.hs-foundation.org/hidradenitis-suppurativa-treatment-and-covid-19-coronavirus/
AAD	https://www.aad.org/member/practice/coronavirus/clinical-guidance/biologics

*For AAD, high-risk is defined as advanced age (60 or older), or patients with recognized comorbidities such as cardiovascular disease, diabetes, severe hypertension, liver disease, kidney disease, respiratory system compromise, internal malignancies or tobacco use.
**For HSF, the recommendation for this cohort also includes those with known COVID-19 exposure.
***The AAD recommendations are not specific to hidradenitis suppurativa.

opinions from the HSF concur with consulting with healthcare providers because immunomodulatory agents may need to be stopped [10]. Certain medications such as prednisone and methotrexate may confer a higher theoretical risk of susceptibility to infections than more specific immunomodulators [10]. However, according to a recent study published in the *New England Journal of Medicine*, the use of biologics in people with chronic immune conditions is not associated with severe COVID-19 requiring hospitalization [12]. Some data even suggest that immunomodulatory agents may have a role in treating the SARS-CoV-2-induced cytokine storm that leads to severe acute respiratory distress syndrome (ARDS), [10].

Acne/rosacea

The AAD has issued guidelines or recommendations on acne or rosacea management during COVID-19 (**Table 4**). In patients with acne or rosacea on isotretinoin and without active COVID-19, the AAD recommends continuing isotretinoin therapy (**Table 4**), [13]. Similar to pre-COVID-19, patients are advised to continue obtaining a new prescription from their dermatologist every 30 days and use two forms of birth control if you are a female with the ability to become pregnant. Two changes regarding the use of isotretinoin is that dermatologists may meet with their patients through telemedicine rather than in person and pregnancy tests may be performed at home with documentation of the date and test result rather than in the clinic.

AAD recommendations for patients with dermatologic diseases on immunosuppressant therapy (not disease-specific)

In patients on systemic immunosuppressive therapy for any dermatological disease who have not tested positive for COVID-19 or shown any symptoms, the AAD states that there is insufficient data to discontinue systemic immunosuppressive treatment during the COVID-19 pandemic (Tables 1-3), [14]. Practitioners should weigh the risks and benefits of the use of systemic immunosuppressive agents on a case-by-case basis.

In lower-risk patients being considered for initiation of systemic immunosuppressive agents, the AAD recommends consulting a physician who can discuss the risks and benefits before administering the medication (**Tables 1-3**), [14]. In high-risk patients, the AAD recommends postponing the initiation of immunosuppressant treatment. "High-risk" patients are defined as those who are age 60 or older or who have recognized comorbidities that include cardiovascular disease, diabetes, severe hypertension, liver disease, kidney disease, respiratory system compromise, internal malignancies, or tobacco use.

In patients on systemic immunosuppressive therapy with active COVID-19 or symptoms of COVID-19, the AAD recommends discontinuing or postponing immunosuppressants until recovery from COVID-19 (**Tables 1-3**), [14].

In patients who have recovered from COVID-19, the AAD recommends re-initiating immunosuppressant therapy upon confirmation that the patient has fully recovered from COVID-19 (**Tables 1-3**), [14].

For more information on COVID-19 or teledermatology during the pandemic, please visit the CDC and AAD websites listed here:

https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html

https://www.aad.org/member/practice/coronavirus/teledermatology

Table 4. *Recommendations on acne or rosacea management by international and U.S. organizations during the COVID-19 pandemic.*

Status of Infection:	International Recommendation:	U.S. Recommendation: American Academy of Dermatology (AAD)
No Active COVID-19 Infection, on isotretinoin therapy	No statement at this time	Continue isotretinoin therapy, meeting with your dermatologist every 30 days via telemedicine, and performing at-home pregnancy tests

Professional Organization:	Resource:
AAD	https://www.aad.org/public/diseases/acne/derm-treat/isotretinoin/coronavirus-pandemic

Discussion

During the COVID-19 pandemic there is evolving evidence regarding the use of systemic medications for dermatological diseases. Various professional dermatology organizations have established their guidelines based on the latest available data. However, some confusion exists regarding where practitioners can reference the existing guidelines for common inflammatory skin diseases. In this article, we summarized international and U.S. guidelines regarding the management of patients with psoriasis, atopic dermatitis, HS, and acne or rosacea during the COVID-19 pandemic.

Although the treatment recommendations regarding each patient population from both the international and U.S. organizations are largely concordant, there are differences in the psoriasis and HS guidelines that are important to highlight. Regarding psoriasis, the IPC, EADV, and AAD recommend that patients with a COVID-19 infection on systemic immunosuppressive therapy should discontinue immunosuppressant treatment (**Table 1**), [7,14]. By comparison, the NPF recommendation within this cohort does not explicitly say to discontinue systemic immunosuppressive treatment; the NPF recommends to consult a healthcare provider who may discuss discontinuing a biologic or oral treatment [5].

Regarding HS, the EHSF and the EADV Acne, Rosacea, HS Task Force recommendation differ from that of the HSF (**Table 3**). According to the EHSF and the EADV Acne, Rosacea, HS Task Force, HS patients with an active COVID-19 infection should discontinue immunomodulatory agents and consult a doctor [11]. By comparison, the HSF does not explicitly say to discontinue immunomodulatory agents; rather, they agree with consulting a healthcare provider before deciding to halt immunomodulatory agents [10].

One potential explanation for the differences in guidelines is that organizations define patients' status of infection differently. Some organizations broadly distinguish between having active COVID-19 and not having active COVID-19, whereas others further define active COVID-19 as either symptomatic, asymptomatic, or mildly symptomatic of COVID-19.

In addition, some organizations differ in whether they account for patients' comorbidities, which may affect treatment decisions. Some treatment recommendations stratify patients' risk based on their comorbid conditions, whereas other treatment recommendations do not stratify peoples' risk and therefore do not delineate different courses based on their comorbidities (Tables 1-3).

There is also emerging data regarding distinct medication characteristics that may influence the choice of one medication over another. For example, some suggest that IL17 and IL23 inhibitors may be more appropriate than TNF inhibitors during COVID-19 based on pre-COVID clinical trial and registry data [15]. However, at the current time more data specific to the differential safety profile of systemic agents in relation to COVID-19 are needed to make recommendations based on potential differences of these systemic agents.

In addition to understanding the safety profiles of different medications, it is also important to understand how the risk of certain medications can change depending on a person's stage of infection. For example, some immunosuppressive and immunomodulatory agents, though considered potentially risky to take in a patient without COVID-19, may actually be used to treat cytokine storms in cases of severe COVID-19. Thus, although the general recommendation in an active COVID-19 infection may be to discontinue immunosuppressive agents such as human interleukin-1 receptor antagonist or anti-interleukin-6, some immunosuppressive agents may be useful in treating the exaggerated immune response associated with COVID-19 [7].

Owing to the dynamic nature of the COVID-19 pandemic, treatment guidelines are likely to be updated in the near future. Data regarding risk factors associated with contracting COVID-19 and having a worse clinical course are important. Patients should be in the care of a clinician who is familiar with recommendations from the various professional bodies and who can adapt these recommendations based on patients' comorbidities.

This article provides up-to-date recommendations regarding psoriasis, atopic dermatitis, HS, and acne or rosacea (Tables 1-4).

Conclusion

In conclusion, the international and U.S. treatment guidelines for psoriasis, atopic dermatitis, HS, and acne or rosacea during the COVID-19 pandemic can be referenced in Tables 1-4. Based on how certain professional organizations define patients' status of infection, guidelines may differ. It is predicted that recommendations will become more nuanced as we learn more about how the mechanism of action of various immunosuppressant and immunomodulating drugs potentially affect the risk of acquiring a SARS-CoV-2 infection as well as the course of the infection. Having COVID-related guidelines for various dermatological diseases summarized and collated in one location can help physicians stay up-to-date on the recommendations and practice based on the latest evidence.

Potential conflicts of interest

RMY and IS declare no conflicts of interest. AWA has served as a research investigator or scientific advisor to Leo, AbbVie, UCB, Janssen, Lilly, Novartis, Ortho Dermatologics, Sun, Dermavant, BMS, Sanofi, Regeneron, Dermira, and ModMed.

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